

UNITED STATES DISTRICT COURT  
EASTERN DISTRICT OF MICHIGAN  
SOUTHERN DIVISION

HENNINGER CONCRETE, INC., an  
Ohio corporation and R.K.W. REDI-MIX,  
a Wisconsin corporation,

Plaintiffs,

vs.

Case No. 02-71767  
Honorable Lawrence Zatkoff

HOLCIM (US), INC., a Delaware  
corporation,

Defendant.

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**PLAINTIFFS' MOTION TO EXCLUDE TESTIMONY  
OF DEFENDANT'S EXPERT WITNESS**

The Plaintiffs move to exclude the testimony of one of the Defendant's expert witnesses.

The attached Brief in Support details the reasons why the expert's opinions are unreliable.

Respectfully submitted,

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Dated: July 9, 2003

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**PLAINTIFFS' BRIEF IN SUPPORT OF ITS  
MOTION TO EXCLUDE TESTIMONY OF  
DEFENDANT'S EXPERT WITNESS**

STATEMENT OF ISSUES

1. Whether the testimony of the Defendant's liability expert is unreliable because of: 1) the continuing business relationship between the expert and the Defendant; and 2) the failure of the expert to consider a wealth of data and information concerning the performance of slag cement in exterior flatwork concrete?

**INDEX OF AUTHORITIES**

*Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed., 2d 469 (1993)

*Freeport-McMoran Resource Partners Ltd. v. B-B Paint Corp.*, 56 F. Supp. 2d 823 (E.D. Mich. 1999)

*Glaser v. Thompson Med. Co., Inc.*, 32 F. 3d 969 (6<sup>th</sup> Cir. 1994)

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## I. INTRODUCTION

The testimony of the Defendant's liability expert, Mr. Michael A. Caldarone, should be excluded from consideration in this case. His opinions would not assist the trier of fact here nor are they reliable. An analysis of the reasoning utilized by Mr. Caldarone reveals several fatal flaws which should negate his participation in this litigation. Accordingly, the Court is requested to issue an order disqualifying Mr. Caldarone from being an expert witness in this matter.

## II. FACTUAL BACKGROUND

This case involves the failure of concrete at hundreds of locations in different states. The concrete was made with slag cement manufactured by the Defendant. The Plaintiffs purchased the slag cement for use in their ready mix concrete businesses. A significant aspect of the case involves the causal connection of the slag cement to the failed concrete. Contrary to voluminous research, the Defendant's expert has taken the unqualified opinion that the slag cement played absolutely no part in the failures of the concrete.

### A. The relationship between the Defendant and its expert.

In support of its position, the Defendant has retained the services of Mr. Michael Caldarone who is employed at Construction Technology Laboratories, Inc. ("CTL"). He joined CTL in 2001 and is currently a principal engineer. Exhibit 1, Dep. T. Michael Caldarone, p. 8. He is involved in various projects on behalf of CTL, including litigation support. *Id.* CTL was formed as a corporation in 1987. Exhibit 1, p. 11. Previously, CTL was the research and development division of the Portland Cement Association ("PCA"). *Id.* The predecessor entity to the PCA was involved in research concerning the manufacturing and use of cement and concrete, including slag cement. Exhibit 1, p. 14. After 1987, CTL's services expanded to include research, project consultations, surveys, and litigation support. Exhibit 1, p. 15.

Significantly, there is a business relationship between CTL and the Defendant outside the scope of this lawsuit. Exhibit 1, p. 16. In fact, the Defendant is an on-going client of CTL's. Exhibit 1, p. 16. The services which CTL provides on behalf of the Defendant outside of this lawsuit include consultation and research related services concerning both cement and concrete technology. Exhibit 1, p. 17. From time to time, CTL receives products manufactured by the Defendant that are tested. *Id.* The cement products tested include slag cements. *Id.* The research CTL has performed on behalf of the Defendant includes the feasibility of using a chemical constituent in a blended hydraulic cement. Exhibit 1, p. 18. The Defendant pays CTL for these services. Exhibit 1, p. 19. Despite its clear obligation, the Defendant has failed to answer Plaintiffs' interrogatory concerning how much it has paid to CTL over the years. See Exhibit 2.

Mr. Caldarone has personally been involved in research on behalf of the Defendant on other projects. He participated in a project involving the performance of cement manufactured by the Defendant that was produced in the South. *Id.*

**B. Mr. Caldarone excludes slag cement as a cause of the concrete failures without even referring to a large body of data and information on the subject.**

Mr. Caldarone testified that he was not aware of any independent research on slag cement performed by CTL. Exhibit 1, p. 20. Yet, employees of CTL published an article entitled "Effects of Ground Granulated Blast-Furnace Slags on Some Properties of Pastes, Mortars, and Concretes". See Exhibit 3. In part, the paper summarizes the results of three separate laboratory studies conducted from 1978 through 1982 on slag cement's influence on concrete. *Id.*, p. 29. The study points out that the generic performance of slag in concrete is less predictable than Portland type 1 cement alone. *Id.*, p. 30. The partial findings and conclusions of the paper were:

1. At normal temperatures, early age strength development is retarded when slags are used. The point in time at which the strength of a slag-cement mixture becomes equivalent to that of a straight cement mixture is a function of the particular slag-cement combination being used.
2. Accelerated curing increases early age strength development for slag-cement mixtures.
3. At low temperature, replacement of cement with slag in mortars results in a substantial loss of strength through 7 days, the latest test age on these studies.
4. Setting time of pastes is retarded when a portion of the cement is replaced by slag.
5. Air-entrained slag-cement concretes are somewhat less resistant to laboratory deicer scaling tests than air-entrained concrete containing solely [portland cement], despite the fact that both concretes had adequate air-void systems.

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This omission by Mr. Caldarone is only part of the story. Even though he agrees that the more information ready-mix company employees have at their disposal the better product they are likely to produce (Exhibit 1, p. 23), there is a large body of data and information which he failed to even consider when preparing his report and opinions. Attached as Exhibit 4 is the text portion of Mr. Caldarone's report.

In addition to the lack of review of data and research, Mr. Caldarone has not examined certain evidence adduced through discovery in this matter. For example, Mr. Calderone testified that he had not reviewed the deposition transcript of Mr. William Maize who was the admixture supplier for Henninger Concrete, Inc. Exhibit 1, pp. 51-52. He did not review it even though he "...would appreciate the opportunities [sic] to review his deposition." *Id.* The deposition of Mr. Maize could contain the kind of information that Mr. Caldarone would want to form his opinions. Exhibit 1, p. 53.

Despite a wealth of relevant data and research, Mr. Caldarone, in effect, bases his opinion almost exclusively on one technical source, i.e., the PCA Design and Control of Concrete Mixtures book ("PCA book"). Exhibit 1, p. 131. He believes that the PCA book is the most authoritative piece of research concerning the issue of susceptibility of concrete made with slag cement. *Id.* Based on the PCA book, Mr. Caldarone is of the opinion that "... concrete containing 40 percent or less slag [is not] particularly susceptible to scaling." *Id.* Finally, he opines that the slag cement used by the Plaintiffs played no role whatsoever in the failures of the cement. Exhibit 1, p. 144, Exhibit 4.

### III. LAW AND ANALYSIS

The Plaintiffs challenge the testimony of Mr. Caldarone based upon *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed., 2d 469 (1993) and its progeny. A *Daubert* challenge was at issue in *Glaser v. Thompson Med. Co., Inc.*, 32 F. 3d 969 (6<sup>th</sup> Cir. 1994), wherein the Court explained that:

Rule 702 admits expert testimony if the evidence will assist the trier of fact and if the witness is qualified as an expert. The Rule provides:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.

*Daubert* explained that Rule 702 must be read in the context of the liberal thrust of the \*972 Federal Rules of Evidence and must be interpreted consistently with the "general approach of relaxing the traditional barriers to 'opinion' testimony." *Daubert*, 509 U.S. at ---, 113 S. Ct. at 2794 (quotations omitted). The Court also cautioned in its opinion that even under these liberal requirements, trial judges must ensure that scientific testimony is not only relevant, but also reliable. *Id.* at ---, 113 S. Ct. at 2975. A court must determine:

whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact at issue. This entails a preliminary assessment of whether the reasoning or methodology

underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue.

*Id.* at ---, 113 S. Ct. at 2796 (footnote omitted).

In assessing scientific validity, the Court provided a non-exclusive list of factors to assist the trial courts: (1) whether a theory or technique can be (and has been) tested, (2) whether the theory or technique has been subjected to peer review and publication, (3) the known or potential rate of error in using a particular scientific technique and the existence and maintenance of standards controlling the technique's operation, and (4) whether the theory or technique has been generally accepted in the particular scientific field. *United States v. Bonds*, 12 F. 3d 540, 555 (6<sup>th</sup> Cir. 1993) (citing *Daubert*, 509 U.S. at ---, 113 S. Ct. at 2796-97). The inquiry must be a flexible one whose "overarching subject is the scientific validity—and thus the evidentiary relevance and reliability—of the principles that underlie a proposed submission."

**1. The testimony of Mr. Calderone is unreliable because of the business relationship between CTL and the Defendant.**

One of the key factors underlying the *Daubert* analysis is whether an expert's testimony is reliable. The courts have couched this analysis in various terms. For example, in *Freeport-McMoran Resource Partners Ltd. v. B-B Paint Corp.*, 56 F. Supp. 2d 823, 831 (E.D. Mich. 1999), the District Court explained that:

[o]ne very significant fact to be considered is whether the experts are proposing to testify about matters growing naturally and directly out of research they have conducted independent of the litigation, or whether they have developed their opinions expressly for purposes of testifying. That an expert testifies for money does not necessarily cast doubt on the reliability of his testimony, as few experts appear in court merely as an eleemosynary gesture. But in determining whether proposed expert testimony amounts to good science, we may not ignore the fact that a scientist's normal workplace is the lab or the field, not the courtroom or the lawyer's office.

Thus, the reliability of an expert's testimony can be undermined if the opinion was developed expressly for litigation.

The Plaintiffs submit that the testimony of Mr. Caldaroni falls under this *Daubert* factor and should be excluded. Mr. Caldaroni testified that he provides litigation support services.



Exhibit 1, p. 11. Standing alone this fact "... does not necessary cast doubt on the reliability of his testimony...". *Freeport-McMoran*, p. 831. When coupled with the past and current business relationship, however, between Mr. Calderone's firm and the Defendant, the scale tips all the way to unreliability. The business relationship between CTL and the Defendant is a long-standing one. CTL provides continuing consultation and research related services concerning cement and concrete for the Defendant. Exhibit 1, p. 17. CTL tests products from the Defendant, including slag cements which are at issue in this lawsuit. *Id.* Mr. Caldaronone has personally been involved in research on behalf of the Defendant on other projects. Exhibit 1, p. 19.

The Defendant pays CTL for these services. The Defendant has failed to answer the Plaintiffs' discovery requests concerning how much has been paid to CTL over the years. Exhibit 2. In short, CTL, and Mr. Caldaronone specifically, know what side of the bread is buttered and who puts the butter on the bread. The long-standing commercial relationship between CTL and the Defendant push Mr. Calderone's testimony over the line of reliability. Therefore, the Court is asked to rule that his testimony inadmissible.

**2. The opinion of Mr. Caldaronone is unreliable because he does not account for even the possibility that the slag cement played a role in the concrete failures.**

The Bibliography attached to Mr. Caldaronone's report lists nine reference materials relied upon by him in the preparation of his opinions. In addition, Mr. Caldaronone partially reviewed a thesis paper from Cornell University. By his own admission, Mr. Caldaronone formulated his opinions without even consulting a large body of data and information concerning slag cement. For example, in Exhibit 3 which is a paper summarizing a long term study published by Mr. Caldaronone's company, it is pointed out that the generic performance of slag in concrete is less predictable than Portland type 1 cement. The CTL paper confirms several differences between

slag cement concretes and concretes made with Portland type 1 cement. Exhibit 3. Mr. Caldarone never even considered this study in reaching his conclusions.

In addition, there are many other published papers and studies ignored by Mr. Caldarone. This partial list includes (excerpts from this research are attached to the Plaintiffs' summary judgment motion concerning warranties):

1. In a 1984 symposium concerning blended cements, employees from Construction Technology Laboratories, which is where the Defendant's expert is employed, reported that "[A]t normal temperatures, early age strength development is retarded when slags are used."; "Accelerated curing increases early age strength development for slag-cement mixtures."; "Setting time of pastes is retarded when a portion of the cement is replaced by slag."; and "Air-entrained slag-cement concretes are somewhat less resistant to laboratory deicer scaling tests than air-entrained concrete containing solely [Portland cement], despite the fact that both concretes had adequate air-void systems."
2. In an article entitled "Evaluation of the Performance of Blast-Furnace Slag and Fly Ash When Blended or Mixed with Portland Cement", warning was given that "some factors which mitigate against the use of BFS or FA as cement components in concrete are: 1. Increased susceptibility to carbonation [4]. Thus blended cements should be avoided in concrete exposed to heavy industrial atmospheres. 2. Slower hardening, which requires prolonged moist curing.
3. "...blended cements (BCs) usually develop strength more slowly than comparable [Portland cements] [2], unless the water/cement (w/c) ratio of the blended cement concrete is significantly reduced [3]."
4. In a 1995 publication by the ACI entitled "Ground Granulated Blast-Furnace Slag as a Cementitious Constituent in Concrete" (co-authored by the Defendant's employee, Mr. Mark Luther) it is reported that "[w]hen GGBF slag is mixed with water, initial hydration is much slower than portland cement mixed with water;" "...as the percentage of GGBF slag increases, a slower strength gain should be expected, particularly at early ages, unless the water content is substantially reduced or accelerators are used or accelerated curing is provided." "Usually, an increase in time of setting can be expected when GGBF slag is used as a replacement for part of the Portland cement in concrete mixtures." "Other factors that can affect the performance of GGBF slag in concrete are water-cementitious materials ratio, physical and chemical characteristics of the Portland cement, and curing conditions."; and "Conversely, Fulton (1974) reports that concrete containing GGBF slag is more susceptible to poor curing conditions than concrete without GGBF slag where the GGBF slag is used in percentages higher than 30%".

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5. Wisconsin Highway Research Program data dated December of 2000 reported "Early experiences with use of GGBFS in paving operations within Wisconsin have noted variable results including slow strength gain, poor resistance to scaling and unusual air void systems."
6. "In order to achieve the same resistance to freezing and thawing with ggbs in the mix as is offered by Portland-cement-only concrete, prolonged moist curing prior to exposure to freezing and thawing is essential."
7. In a 3-phase, long term study from a published thesis report from Cornell University entitled "The Deicer Salt Scaling Resistance of Slag Cement Concrete: Results of Field and Laboratory Studies", it is concluded that: slag cements can be used successfully with careful curing to produce concrete resistant to scaling. There must be, however, "...strict adherence to proper (existing) procedures and recommendations regarding concrete mix design, placement, finishing, and curing." Table 1-1 lists the recommendations including a maximum water-to-cementitious materials ratio of 0.45, air content of  $6.5\% \pm 1.5\%$ , proper timing of finishing and not adding water, a strict curing regime, and a 30 day drying period (after curing) before deicer salt is applied.

Other examples of Mr. Caldarone's self-serving literature review include the American Concrete Institute ("ACI") report listed first in his Bibliography. In the ACI report, it is explained that:

[a]s reported by *Malhotra* (1987), all of these systems can provide concrete properties similar to those found with Portland cement with the exception that in freezing and thawing environments, a minimum of  $200\text{kg/m}^3$  ( $337\text{ lb/yd}^3$ ) of Portland cement and a low water-cementitious materials ratio are desired to provide adequate resistance to freezing and thawing environments. ...

GGBF slag is more susceptible to poor curing conditions than concrete without GGBF slag where the GGBF slag is used in percentages higher than 30 percent.

This data directly conflicts with Mr. Caldarone's conclusions that the slag must be at least 40 percent before it is more sensitive to poor curing conditions and that the slag cement played no role in the concrete failures.

Mr. Caldarone considers the PCA book as the most authoritative piece of research concerning the susceptibility of concrete made with slag cement. Exhibit 1, p. 131. Yet, that

resource contradicts both the Defendant's warranties that slag cement is identical to Portland type 1 cement and Mr. Caldarone's opinions. In the PCA book it is generally reported that, without regard to the amount of slag present:

1. "Ground slag usually decreases water demand by 1% to 10%, depending on dosage."
2. "Slags ground finer than cement reduce bleeding."
3. "Ground slags have variable effects on the required dosage rate of air-entraining admixtures."
4. "... ground slag [has] a lower heat of hydration than Portland cement; consequently their use will reduce the amount of heat built up in a concrete structure."
5. "The use of ground granulated blast-furnace slag will generally retard the setting time of concrete ...".
6. "... the curing time may need to be longer for certain materials with slow-early-strength gain."
7. "Proper curing of all concrete, **especially concrete containing** supplementary cementing materials, should commence immediately after finishing." (emphasis added)
8. It is imperative for development of resistance to deterioration from cycles of freezing and thawing that a concrete have adequate strength and entrained air. For concrete containing supplementary cementing materials to provide the same resistance to freezing and thawing cycles as a concrete made using only Portland cement as a binder, four conditions for both concretes must be met:
  1. They must have the same compressive strength.
  2. They must have an adequate entrained air content with proper air-void characteristics.
  3. They must be properly cured.
  4. They must be air-dried for one month prior to exposure to saturated freezing conditions.

None of this information, which has many similarities to the Cornell thesis studies, was told to the Plaintiffs by the Defendant. In addition to ignoring relevant data, the research relied upon by Mr. Caldarone actually supports the Plaintiffs' positions.

In *Kamp v. SMC Corp.*, 2002 U.S. Lexis 12365 (E.D. Mich. 2002), the plaintiff was injured while working with a hydraulic sprayer in a cherry orchard. Exhibit 4. The plaintiff's expert was to testify that the sprayer was defectively designed. The court excluded the expert's testimony, in part, on the consideration of "whether the expert has adequately accounted for obvious alternative explanations ..." *Kamp*, p. 11. The testimony was unreliable because "[t]here is no accounting for the possibility that the [clip on the sprayer] was installed improperly." *Id.*

Similarly, Mr. Caldarone has not accounted for the obvious explanation that the Defendant's slag cement was at least a partial cause of the concrete failures. He failed to even bother to review a host of data and information about slag cement. The selective literature he does refer to clearly document the differences between slag cement and Portland type 1 cement. Mr. Caldarone's unqualified opinion that the slag cement used by the Plaintiffs played no role whatsoever in the failures is unreliable. He fails to account for this obvious alternative explanation. Therefore, the Court is requested to strike Mr. Calderone's testimony because it is unreliable.

Respectfully submitted,

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**NOTICE OF HEARING**

PLEASE TAKE NOTICE that the Plaintiffs' Motion to Exclude Testimony of Defendant's  
Expert Witness will be brought on for hearing if the Court determines that oral argument would aid  
in the decision-making process.

Respectfully submitted,

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